Haptics: Science, Technology and Applications

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Abstract
The human haptic system presents a uniquely bi-directional information channel between our hands and brains, but is underutilized. Recent development of haptic technologies that enable users to touch, feel, and manipulate virtual or remote objects, show promise in myriad applications such as education, training, healthcare, hazardous operations and manufacturing. In this talk, the scientific and technological underpinnings of the field of Haptics will be described. An overview will be provided of our advances in skin biomechanics, tactile neuroscience, human haptic perception, robotic hardware and real-time simulation software, all of which have helped establish Haptics as an exciting area of research. While our past contributions to its applications such as virtual-reality-based simulators for training surgeons, real-time touch interactions between people across the internet and direct control of machines from brain signals will be briefly described, more details of our recent work on telehaptics for micro/nano-exploration, manipulation and assembly will be given.

Keywords: Human haptics micro / nano manipulation